

**WHAT IS CLAIMED IS:**

1           1.    An imaging device comprising:  
2                   a plurality of active pixel sensor cells, each  
3   having a photosensor, a row select transistor, and an output  
4   transistor including a gate connected to a pixel output  
5   voltage; and

6                   a readout circuit connectable to each of said APS  
7   cells, said readout circuit including an amplifier, said  
8   amplifier including the row select transistor and the output  
9   transistor of each of a plurality of said active pixel sensor  
10   cells.

1           2.    The imaging device of claim 1, wherein the amplifier  
2   provides a gain of about one or higher.

1           3.    The imaging device of claim 1, wherein the amplifier  
2   comprises:

3                   a first branch comprising:

4                           a first transistor having a drain connected to

5                           a first voltage source;

6                           the row select transistor of each pixel; and

7                           the output transistor of each pixel;

8                   a second branch comprising:

9 a second transistor having a drain connected to  
10 the first voltage source;

11 a third transistor having a gate connected to a  
12 second voltage source; and

13 a source follower transistor having a drain  
14 connected to a source of each of the third  
15 transistor and the output transistor of each pixel.

1 4. The imaging device of claim 3, wherein the first  
2 voltage source comprises  $V_{DD}$ .

1 5. The imaging device of claim 3, wherein each of the  
2 first and second transistors comprise a p-type transistor and  
3 each of the row select transistors, output transistors, third  
4 transistor, and source follower transistor comprise an n-type  
5 transistor.

1 6. The imaging device of claim 3, further comprising a  
2 fourth transistor connected between the third transistor and  
3 the source follower transistor, said fourth transistor  
4 comprising a gate connected to the first voltage source.

1 7. The imaging device of claim 3, wherein each pixel  
2 and the amplifier are connected to a column line, and further

3 comprising a switch in each pixel to shield the output  
4 transistor from voltage changes in the column line.

1 8. The imaging device of claim 7, wherein the switch  
2 comprises a blocking transistor connected between a drain of  
3 the output transistor and the first transistor, said blocking  
4 transistor having a gate connected to a gate of the row select  
5 transistor.

1 9. The imaging device of claim 1, further comprising a  
2 gain selector to enable a change in gain in the amplifier.

1 10. The imaging device of claim 3, further comprising a  
2 gain selector to enable a change in gain in the amplifier,  
3 said gain selector comprising:

4 a first gain transistor having a drain connected to the  
5 first voltage source; and

6 a first gain-enable transistor connected between a source  
7 of the gain transistor and the source of the first transistor,  
8 wherein while the first gain-enable transistor is  
9 conducting, the first transistor and the first gain transistor  
10 are connected in parallel.

1 11. The imaging device of claim 10, wherein the gain  
2 selector further comprises:

3 a second gain transistor having a drain connected to the  
4 first voltage source; and

5 a second gain-enable transistor connected between a  
6 source of the second gain transistor and the source of the  
7 second transistor,

8 wherein while the second gain-enable transistor is  
9 conducting, the second transistor and the second gain  
10 transistor are connected in parallel.

1 12. The imaging device of claim 10, wherein each of the  
2 first gain transistor and the first gain enable transistor is  
3 p-type transistor.

1 13. An imaging device comprising:  
2 a plurality of active pixel sensor cells, each  
3 having a photosensor, a row select transistor, and an output  
4 transistor including a gate connected to a pixel output  
5 voltage; and

6 a readout circuit connectable to each of said APS  
7 cells, said readout circuit including an amplifier, said  
8 amplifier comprising:

9 a first branch comprising:

10 a first transistor having a drain connected to  
11 a first voltage source;

12 the row select transistor of each pixel; and

13 the output transistor of each pixel;  
14 a second branch comprising:  
15 a second transistor having a drain connected to  
16 the first voltage source;  
17 a third transistor having a gate connected to a  
18 second voltage source;  
19 a fourth transistor; and  
20 a source follower transistor having a drain  
21 connected to a source of each of the fourth  
22 transistor and the output transistor of each pixel.

1 14. The imaging device of claim 13, wherein the  
2 amplifier provides a gain of about one or higher.

1 15. The imaging device of claim 3, wherein the first  
2 voltage source comprises  $V_{DD}$ .

1 16. The imaging device of claim 13, wherein each of said  
2 transistors comprise a MOSFET.

1 17. The imaging device of claim 3, wherein each of the  
2 first and second transistors comprise a p-type transistor and  
3 each of the row select transistors, output transistors, third  
4 transistor, fourth transistor, and source follower transistor  
5 comprise an n-type transistor.